

Appn. No. 09/621,249 Filed: July 21, 2000  
Applicants: Allen D. Hertz, et al. Examiner/GAU:Frankie L. Stinson/ 1746  
Title: **METHOD AND APPARATUS FOR ACOUSTIC AND VIBRATIONAL ENERGY FOR ASSISTED DRYING OF SOLDER STENCILS AND ELECTRONIC MODULES**

Date: May 09, 2003

#### Inventor's Affidavit - Development Timeline

I hereby attest that I, Dennis Epp, Applicant in said invention believe that the following timeline is true to the best of my knowledge and supporting documentation:

- Date of Conception for using ultrasonic energy for enhanced soldering: November 08, 1997 (See Page 4 of the disclosure statement – Exhibit A)
- Application of ultrasonic / vibrational energy for increased solderability.
- Experiments completed prior to January 13, 1998 at Racal Datacom in Sunrise, FL using an ultrasonic horn taught that the ultrasonic horn introduces energy into the process that removes oxides (cleaning process) and causes heat which can be used for drying. (Data Sheet faxed to Heller Industries – Exhibit B)
- Discussion of concepts with EMC under NDA (Proprietary Inventors Agreement dated Feb. 10, 1998 – Exhibit C)
- Discussion of concepts with MPM under NDA (Proprietary Inventors Agreement dated March 04, 1998 – Exhibit D)
- Further understanding of the cleaning and drying abilities when applying vibrational energy for cleaning and drying electronics: Using the vibrational energy to atomize the residual fluid: July, 1998
- Realization during the efforts on the ultrasonic energy for enhanced soldering reduction to practice. The first reduction to practice was when Eric Hertz held an ultrasonic gun (borrowed from Branson Ultrasonics) against a Styrofoam cup filled with water. This procedure was invented by Eric Hertz as a means to determine the proper tuning of the ultrasonic gun. During this test, both Allen Hertz and Eric Hertz recognized in addition to the cleaning and heat, the ultrasonic energy causes the water within the cup to atomize and evaporate. These experiments were completed at Hepco, in San Jose, CA.

- Further developments continued testing cleaning and drying on Electronic Assemblies using both water and alcohol.
- Experiments for applying ultrasonic energy for both print release and solder stencil cleaning / drying were completed at the MPM facility in Franklin Park, MA in September, 1998 and again in December, 1998. (See Nass correspondence dated Oct. 26, 1998 – Exhibit E)
- Addition of In-Line Cleaning systems to concept at NEPCON in Anaheim, CA, February, 1999.
- Experiments completed at DEK, Flemington, NJ in February, 1999 (See partially completed NDA dated January 21, 1999 – Exhibit F)
- Experiments completed at Heller in Florham Park, New Jersey in February, 1999.
- Further experiments were completed at Branson's facility in Danbury CT, in May of 1999. (See Branson / Galahad NDA – Exhibit G)
- Details of the various concepts were generated throughout the timeline by all three inventors (Allen Hertz, Eric Hertz, and Dennis Epp)
- Provisional Application Ser. No. 60/145,524 Filed July 24, 1999.
- Utility Application: The utility patent application, Ser. No. 09/621,249 was filed on July 21, 2000, claiming priority to the provisional application, Ser. No. 60/145,524.

The foregoing instrument was acknowledged before me on this 2nd day of May 2003

  
Dennis Epp  
06/02/03  
Date

Notary  
                          
Date

Best Available Copy

**CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT**

State of California

County of

Orange

ss.

On June 2, 2003, before me,

Date

Valerie A. Avila, Notary Public

Name and Title of Officer (e.g., "Jane Doe, Notary Public")

personally appeared

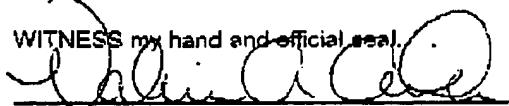
Dennis E. Po

Name(s) of Signer(s)

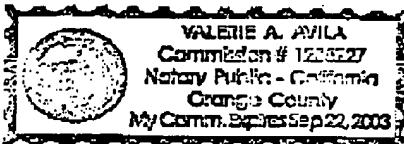
 personally known to me proved to me on the basis of satisfactory evidence

to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.



Signature of Notary Public



Place Notary Seal Above

**OPTIONAL**

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

**Description of Attached Document****Title or Type of Document:**Inventor's Affidavit**Document Date:**June 2, 2003**Number of Pages:**two**Signer(s) Other Than Named Above:**none**Capacity(ies) Claimed by Signer****Signer's Name:**

- Individual
- Corporate Officer — Title(s): \_\_\_\_\_
- Partner —  Limited  General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: \_\_\_\_\_

**Signer Is Representing:**RIGHT THUMPFPRINT  
OF SIGNER

Top of thumb here

Best Available Copy

## **Index of Exhibits**

Racal Datacom Cover Letter and respective Disclosure (9 pages) Exhibit A

Note: Date of conception, Saturday, Nov. 08, 1997 in Section D1 of Page 4/8  
Removes oxides is effectively cleaning - Noted in Para 2 of Page 8/8

## **Experimental Data**

## **Exhibit B**

Fax Date: February 6, 1998 from KB Electronics to Heller Industries and returned from Heller to KB the same day.

Experiments were completed before January 13, 1998 (Date Allen Hertz was laid off at Racal Datacom) at Racal Datacom, Sunrise, FL.

**Proprietary Invention Agreement (Epp / Hertz – MPM) (3 pages)**      **Exhibit C**  
**Dated March 4, 1998**

**Proprietary Invention Agreement (Epp / Hertz – EMC) (3 pages)**      **Exhibit D**  
**Dated February 10, 1998**

**Branson letter to Eric Hertz (1 page)** **Exhibit D1**  
**Dated August 12, 1998**

**Branson Loan Statement of Ultrasonic Gun** **Exhibit D2**  
**Dated September 30, 1998**

Galahad – Ed Nauss correspondence dated Oct. 26, 1998 (1 page) Exhibit E

Proprietary Information Agreement (Graham - DEK) (- pages) EXHIBIT F  
Dated January 21, 1999

Proprietary Invention Agreement (Galaloid - Branson) (5 pages) Exhibit G  
Date 1 May 25, 1992

**Best Available Copy**